

# Independently conducted studies

using Nozin<sup>®</sup> Nasal Sanitizer<sup>®</sup> antiseptic



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16	Pratt N et al. Am. J. Infect. Control. 2022. 50(7S), S31	✓	✓				10
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## Reduction of nasal *Staphylococcus aureus* carriage in health care professionals by treatment with a nonantibiotic, alcohol-based nasal antiseptic.

Steed, L. L., Costello, J., Lohia, S., Jones, T., Spannhake, E. W., & Nguyen, S. (2014). American Journal of Infection Control, 42(8), 841-846. <https://doi.org/10.1016/j.ajic.2014.04.008>

- Randomized double-blind, placebo-controlled study tested the effectiveness of a nonantibiotic, alcoholbased antiseptic in reducing nasal bacterial carriage in health care professionals (HCPs) at an urban hospital center.
- HCPs testing positive for vestibular *S aureus* colonization were treated with topical antiseptic or control preparations.
- Nasal *S aureus* and total bacterial colonization levels were determined before and at the end of a 10-hour workday.
- Antiseptic treatment produced a uniform reduction in colony forming units (CFUs) at 99% (median) for *S aureus* and 91% (median) for total bacteria.
- Nasal application of a nonantibiotic, alcohol-based antiseptic was effective in reducing *S aureus* and total bacterial carriage, suggesting the usefulness of this approach as a safe, effective, and convenient alternative to antibiotic treatment.

DAILY INPATIENT	PERIOPERATIVE		PRODUCT REPLACED	EXISTING CHG USE
	PRE	POST		

## Impact of Reduced Isolation and Contact Precaution Procedures on Infection Rates and Facility Costs at a Non-Profit Acute Care Hospital.

Deatherage, N. (2016). American Journal of Infection Control, 44(S6), S101–S102. <https://doi.org/10.1016/j.ajic.2016.04.091>

- Replaced contact precautions and isolation with daily nasal decolonization with alcohol-based nasal antiseptic for all MRSA patients (history, colonized or active). (12-month trial)
- Additionally, did daily bathing with chlorhexidine gluconate cloths for all Intensive Care Unit patients.
- Low MRSA HAI rates/1000 patient days were maintained during the trial despite the change in CP Procedures. (Averages 0.152, 0.122, and 0.126 pre-intervention, versus 0.124 post-intervention)
- CP-related PPE costs were reduced by \$64,350 annually.

DAILY INPATIENT	PERIOPERATIVE		PRODUCT REPLACED	EXISTING CHG USE
	PRE	POST		
✓				

## Perioperative participation of orthopedic patients and surgical staff in a nasal decolonization intervention to reduce *Staphylococcus* spp surgical site infections.

Mullen, A., Wieland, H. J., Wieser, E. S., Spannhake, E. W., & Marinos, R. S. (2017). American Journal of Infection Control, 45(5), 554-556. <https://doi.org/10.1016/j.ajic.2016.12.021>

- Implementation of alcohol-based antiseptic nasal decolonization program for spine surgery patients: combined pre-operative nasal decolonization with existing chlorhexidine bath or wipes, plus post-operative nasal decolonization daily for 5 to 7 days.
- High level of adherence: Patient nasal decolonization rates averaged 95% over the 15-month trial period.
- To address transmission risk, voluntary self-decolonization by preoperative staff was actively encouraged.
- *S aureus* SSI rates were significantly decreased by 81% from 1.76 to 0.33 per 100 surgeries.
- The reduction in aureus SSIs observed in the spine surgical group during the intervention was not experienced by other surgical groups at the facility during that time, suggesting the strength of the association between nasal antiseptic use and the reduced infection rates is high.

DAILY INPATIENT	PERIOPERATIVE		PRODUCT REPLACED	EXISTING CHG USE
	PRE	POST		
	✓	✓	mupirocin	✓

## A Novel Protocol for Nasal Decolonization Using Prolonged Application of an Alcohol Based Nasal Antiseptic Reduces Surgical Site Infections.

Bostian, P., Murphy, T. R., Klein, A., Frye, B., Dietz, M., & Lindsey, B. (2018). Presented at American Association of Orthopedic Surgeons (AAOS) Annual Conference 2018. [https://bit.ly/AAOS\\_2018\\_Bostian](https://bit.ly/AAOS_2018_Bostian)

- Total joint arthroplasty patients underwent nasal sanitization using an alcohol-based agent. (7-month trial)
- Applied pre-operatively and daily for two weeks post-operatively.
- Decolonization with the alcohol-based antiseptic was associated with a 78.5% reduction in surgical site infection (1/293 vs 7/527,  $p = 0.045$ , odds ratio = 4.5)
- Compliance was greater than 75% throughout the course of prolonged treatment.
- This low-cost intervention with high compliance rate significantly reduced our infection rate when introduced to the hospital system.

DAILY INPATIENT	PERIOPERATIVE		PRODUCT REPLACED	EXISTING CHG USE
	PRE	POST		
	✓	✓		✓

## Does Universal Nasal Decolonization with an Alcohol-Based Nasal Antiseptic Reduce Infection Risk and Cost?

Arden, S. (2019). Open Forum Infectious Diseases, 6(S2), S268 <https://doi.org/10.1093/ofid/ofz360.636>

- House-wide application of alcohol-based nasal antiseptic in place of screening and contact precautions (CP) for MRSA colonized patients. (12-month trial)
- Preoperative application of alcohol-based nasal antiseptic to all surgical patients in addition to existing preoperative chlorhexidine bathing.
- Reduced incidence of MRSA bacteremia from 3/1,000 patient-days to 0/1,00 patient-days.
- Reduced incidence of all-cause surgical site infection (SSI) for all types of surgical procedures – from 3/4,313 procedures to 0/4,872 procedures.
- Reduction in CP from 3.79 to 1.53/1,000 patient-days.
- Significant costs avoided—after accounting for the cost of the nasal antiseptic, the reductions in gowns, gloves and nasal screening resulted in \$104,099 costs avoided in 12-months.

DAILY INPATIENT	PERIOPERATIVE		PRODUCT REPLACED	EXISTING CHG USE
	PRE	POST		
✓	✓	✓		✓

## Reduction of Hospital-Onset Methicillin-Resistant *Staphylococcus aureus* (MRSA) Bacteremia in an Acute Care Hospital: Impact of Bundles and Universal Decolonization.

Jimenez, A., Sposato, K., De Leon Sanchez, A., Williams, R., & Francois, R. (2019). *Open Forum Infectious Diseases*, 6(S2), S268. <https://doi.org/10.1093/ofid/ofz360.635>

- Screen and isolate in ICU plus CHG bathing for all ICU patients was replaced by universal decolonization bundle hospital-wide (alcohol-based nasal antiseptic, CHG bathing and alcohol-based wipes for patient hand hygiene).
- Four phase quality improvement project, with 20-month intervention period.
- There was a significant decrease in the SIR after the introduction of alcohol-based nasal antiseptic (Phase 3).
- The largest decrease in cases and SIR was observed during Phase 4 when hospital-wide alcohol-based nasal sanitizer together with alcohol-wipes for patient hand hygiene were added to daily CHG bathing.
- Nasal surveillance cultures and contact precautions (CP) for methicillin-resistant *Staphylococcus aureus* (MRSA)-colonized patients were discontinued.
- The Hospital-Onset MRSA bacteremia standardized infection ratio (SIR) decreased from 3.66 to 0.97 from baseline to post-intervention periods—a 74% reduction.

DAILY INPATIENT	PERIOPERATIVE		PRODUCT REPLACED	EXISTING CHG USE
	PRE	POST		
✓			mupirocin	✓

## Impacts of Coordinated, Hospital-wide Use of Alcohol-based Nasal Decolonization on Infection Rates, Patient Care and Cost Savings.

Landis-Bogush, K., & Belani, A. (2019). *American Journal of Infection Control*, 47(S6), S39. <https://doi.org/10.1016/j.ajic.2019.04.091>

- Pre-operative iodine was replaced by pre-/post-operative alcohol-based nasal decolonization. (17-month trial)
- All adult inpatients received daily nasal decolonization. (19-month trial)
- Contact precautions (CP) for methicillin-resistant *Staphylococcus aureus* (MRSA)-colonized patients were discontinued.

- Staphylococcus aureus surgical site infection (SSI) rates decreased by 50.7% from 0.148/100 to 0.073/100 beyond the prior iodine-based protocol.
- CP use decreased by 39%, while maintaining low rates of MRSA bacteremia.
- Annualized savings of \$223,150, net of decolonization costs, were estimated from CP, screening and SSI cost reductions.
- Improved nursing-care patient accessibility and cost-savings through reduction in CP use.
- Compliance rates with nasal antiseptic 96%.

DAILY INPATIENT	PERIOPERATIVE		PRODUCT REPLACED	EXISTING CHG USE
	PRE	POST		
✓	✓	✓	iodophor	✓

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### Alcohol-Based Nasal Antiseptic as Part of a Bundle to Reduce the Incidence of Contact Precautions and Surgical Site Infections.

Stegmeier, H. (2019). Open Forum Infectious Diseases, 6(S2), S446. <https://doi.org/10.1093/ofid/ofz360.1101>

- All high-risk patients received daily alcohol-based nasal antiseptic and chlorhexidine (CHG) bath, in place of targeted screening and CP. (12-month study)
- All orthopedic surgical patients received nasal alcohol-based antiseptic in place of screening and decolonization with mupirocin. Preoperative CHG bathing was already in place and was continued. Patients who remained in the hospital post-operatively received daily nasal antiseptic and CHG bathing.
- There was a reduction in the incidence of CP from 16% to 10% per day, while maintaining a rate of zero MRSA bacteremia.
- Reduction of gloves, gowns and nasal PCR tests, resulted in an estimated total cost reduction of \$200,000.
- A statistically significant reduction in total hip SSI from a baseline of 1.15 infections per 100 procedures to 0.017 infections per 100 procedures (98% reduction, P = 0.014.), and the rate of zero SSI in total knee replacement patients was maintained.

DAILY INPATIENT	PERIOPERATIVE		PRODUCT REPLACED	EXISTING CHG USE
	PRE	POST		
✓	✓	✓	mupirocin	✓



## A Safe, More Cost-Effective Protocol: Universal Decolonization vs. MRSA Screening and Contact Precautions.

Whitaker, J. (2019). Open Forum Infectious Disease, 6(S2), S25. <https://doi.org/10.1093/ofid/ofz359.055>

- Universal decolonization (alcohol-based nasal antiseptic plus chlorhexidine gluconate bathing) for all inpatients was instituted as a replacement for targeted nasal screening, contact precautions (CP) and decolonization with mupirocin of methicillin-resistant Staphylococcus aureus (MRSA)-colonized patients. (12-month trial)
- 42% reduction in isolation days (\$118/day), a 74% reduction in nasal PCR tests (\$36/each), and an 11% decrease in the monthly use of gowns (\$12/each).
- The total cost avoidance (after accounting for the cost of the alcohol-based nasal antiseptic and CHG soap) was \$1,394,685.
- There was no statistical change in the MRSA bacteremia rate (0.067 to 0.070) per 1,000 patient-days.

DAILY INPATIENT	PERIOPERATIVE		PRODUCT REPLACED	EXISTING CHG USE
	PRE	POST		
✓				

## Improving patient compliance with preoperative universal decolonization to reduce surgical infection rate and costs.

Candray, K. (2020). Open Forum Infectious Diseases. 7(S1), S479 <https://doi.org/10.1093/ofid/ofaa439.1077>

- To address spine patient non-compliance with preoperative nasal decolonization, replaced nasal povidone iodine (PVI) with alcohol based nasal antiseptic, paired with already in place preoperative bathing with chlorhexidine (CHG) foam soap, for all spine fusion and laminectomy patients. (3-month trial)
- Reduction in surgical site infections (SSI) of 64% from 0.58 to 0.21/100 spine fusion procedures and a reduction in SSI of 100% from 0.46 to 0.00/100 laminectomy procedures.
- Estimated cost avoidance of \$127K associated with infections prevented.
- \$37K per year cost savings resulting from switching from nasal povidone-iodine to alcohol based nasal antiseptic.

DAILY INPATIENT	PERIOPERATIVE		PRODUCT REPLACED	EXISTING CHG USE
	PRE	POST		
	✓		iodophor	✓

## Universal Preoperative Antiseptic Nasal and Skin Decolonization for Reduction in SSI and Associated Costs.

Cernich, C. (2020). American Journal of Infection Control, 48(S8), S50. <https://doi.org/10.1016/j.ajic.2020.06.065>

- Alcohol based nasal antiseptic was applied to all pre-operative patients in addition to chlorhexidine bathing already in place. (6-month trial)
- Resulted in a 59% reduction in all cause surgical site infections (SSI) for all procedures, from an average monthly baseline rate of 0.61 to an average monthly rate of 0.25.
- This reduction represents 22 fewer SSI with an associated estimated cost avoidance of \$457,270 (\$20,785/infection).
- This nasal antiseptic was selected over other nasal decolonizing agents in support of staff satisfaction and antibiotic stewardship goals.
- The staff survey revealed that 86% of respondents were very or extremely satisfied with efficacy and ease of use of the product, and >80% preferred the nasal antiseptic over mupirocin.

DAILY INPATIENT	PERIOPERATIVE		PRODUCT REPLACED	EXISTING CHG USE
	PRE	POST		
	✓			✓

## Can a nasal and skin decolonization protocol safely replace contact precautions for MRSA-colonized patients?

Christie, J., Wright, D., Liebowitz, J., & Stefanacci, P. (2020). American Journal of Infection Control, 48(8), 922–924. <https://doi.org/10.1016/j.ajic.2019.12.016>

- 7 network hospitals replaced contact precautions (CP) for high-risk MRSA-colonized patients with targeted nasal and body decolonization, leading to significant cost savings and staff satisfaction without any increase in MRSA transmission.
- Alcohol-based nasal antiseptic was selected for enhanced effects when compared to PVI and mupirocin: it does not stain, is clean and well tolerated by patients, has a pleasant citrus odor, is suitable for selfapplication, is effective after a single application and has no known current mechanisms that contribute to microbial resistance.
- The impact of intervention was measured by comparing isolation day rates for MRSA-colonized patients and the associated costs of CP (disposable gloves and gowns), both at baseline (10-month preintervention) and for the 10-month decolonization study.

- Analysis of all 7 hospitals combined resulted in an overall decrease in isolation days of 88.33% (P = .000), and a reduction of glove and gown use with an associated net cost savings of \$430,604 for the 10-month study (\$42.32 average daily cost of contact precautions, \$6.25 daily cost of Nozin plus CHG).
- There was no increase in the overall MRSA bacteremia SIR (P = .916, 95% confidence interval 0.606, 1.598).
- The majority of nurses/health care workers surveyed (89%) would recommend the alcohol-based nasal antiseptic to colleagues, and 94% of respondents who had previous experience with mupirocin preferred the alcohol-based nasal antiseptic.

DAILY INPATIENT	PERIOPERATIVE		PRODUCT REPLACED	EXISTING CHG USE
	PRE	POST		
✓				

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## A safer, less costly SSI prevention protocol—Universal versus targeted preoperative decolonization.

Franklin, S. (2020). American Journal of Infection Control, 48, 1501–1503. <https://doi.org/10.1016/j.ajic.2020.02.012>

- Added nasal decolonization with alcohol-based nasal antiseptic to the existing preoperative CHG bath for total joint patients (total hip and knee replacements). 12 month trial.
- Nasal decolonization was continued daily post-operatively while the patient was hospitalized.
- Resulted in a reduction in the total hip SSI rate from 0.91 to 0.00 per 100 procedures, and a reduction in the total knee SSI rate from 0.36 to 0.00 per 100 procedures.
- This represents a reduction of 4 total joint infections every 12 months, with an estimated associated total cost of more than \$400,000 annually.
- Staff satisfaction survey showed >90% were satisfied with the ease of use with the alcohol-based nasal antiseptic and would recommend it to colleagues in other departments and hospitals.
- Increased patient satisfaction: comments included an appreciation of the decolonization protocol as an extra step to make them safer, and they liked the mild, pleasant scent.

DAILY INPATIENT	PERIOPERATIVE		PRODUCT REPLACED	EXISTING CHG USE
	PRE	POST		
	✓			✓

## Improving outcomes with revised preoperative universal decolonization protocol.

Gnass, S. (2020). Open Forum Infectious Diseases. 7(S1), S479 <https://doi.org/10.1093/ofid/ofaa439.1076>

- Universal preoperative decolonization protocol was implemented, replacing povidone iodine based nasal antiseptic with alcohol-based nasal antiseptic. (6-month trial)
- The nasal antiseptic was paired with preoperative chlorhexidine bathing (already in place).
- 63% reduction (p=.0162) in all-cause SSI for all types of surgical procedures
- Savings of \$589,420 during 6-month period (from avoidance of 17 SSIs during that same period)
- Alcohol-based nasal antiseptic was also provided to surgical team for application prior to each shift (not mandatory and compliance was not tracked; informal feedback/observation revealed most surgical team members were applying the nasal antiseptic prior to cases daily).

DAILY INPATIENT	PERIOPERATIVE		PRODUCT REPLACED	EXISTING CHG USE
	PRE	POST		
	✓		iodophor	✓

## Effectiveness of an Alcohol-Based Nasal Antiseptic in Reducing MRSA Bacteremia in an Adult Intensive Care Population.

Reeves, L., Barton, L., Williams, J., Don Guimera, Williams, B., Hysmith, N., & Morton, J. (2020). Infection Control & Hospital Epidemiology, 41(S1), s206. <https://doi.org/10.1017/ice.2020.748>

- Universal alcohol-based nasal antiseptic daily in adult intensive care setting. (7-month trial)
- 100% reduction in MRSA bacteremia: The rate of MRSA bacteremia declined from baseline at 0.2404 to 0. (12,475 patient-days in the retrospective group vs 12,733 in the prospective group).
- The alcohol-based nasal antiseptic was effective in reducing healthcare-onset MRSA bacteremia in intensive care population.
- This approach may be a safe and effective alternative to nasal antibiotic ointment that avoids antibiotic resistance risks.

DAILY INPATIENT	PERIOPERATIVE		PRODUCT REPLACED	EXISTING CHG USE
	PRE	POST		
✓				

## Alcohol-based Nasal Decolonization and Chlorhexidine Bathing to Reduce Methicillin-resistant Staphylococcus Aureus Hospital-acquired Infections in Critical Patients.

Pratt, N., Heishman, C., Blizard, K., & Cissell, J. (2022). American Journal of Infection Control, 50, 7(S7), S31. <https://doi.org/10.1016/j.ajic.2022.03.048>

- Implemented a universal decolonization protocol within the critical care population of a large academic medical facility.
- Protocol: alcohol-based nasal decolonization plus chlorhexidine gluconate (CHG) bathing daily for length of stay.
- Inclusion criteria:
  - adult patients admitted to critical care
  - patients undergoing a procedure involving a surgical incision
- Study duration: 6-month baseline and 6-month intervention.
- Outcome: **62.5% reduction in hospital-associated LabID MRSA BSIs.**
- While not deemed statistically significant for this short study period as indicated by a two-tailed t-test (p-value 0.19, CI 95% [-0.56,2.23]), the overall reduction in HAI should be considered relevant to patient outcomes and overall infection prevention considerations.
- Implications for practice:
  - Decolonization protocols have shown to reduce HAI events.
  - This could contribute to decreased length of stay, decreased morbidity and mortality, and decreased financial burden.

DAILY INPATIENT	PERIOPERATIVE		PRODUCT REPLACED	EXISTING CHG USE
	PRE	POST		
✓	✓			

## Increasing Compliance with Hospital-Wide Universal Decolonization Protocol Decreases Methicillin-resistant Staphylococcus Aureus (MRSA) Bacteremia.

Montalvo Gonzalez, L., Macedo-Rea, M., Manos, O., et al. American Journal of Infection Control, Volume 51, Issue 7, S54 <https://doi.org/10.1016/j.ajic.2023.04.111>

- The study evaluated the impact of improved compliance with an existing universal decolonization protocol on reducing MRSA bacteremia. The decolonization protocol consisted of a daily chlorhexidine gluconate (CHG) bath and twice daily nasal antiseptic application universally.
- To reduce MRSA bacteremia rate, the facility implemented a multidisciplinary approach to increase universal decolonization compliance, coordinating interventions by infection prevention, data analytics, nursing, and leadership.
- By improving the compliance rate for nasal antiseptic (Nozin Nasal Sanitizer) application from 84% to 94% and for chlorhexidine gluconate (CHG) bathing from 53% to 81%, the hospital was able to reduce MRSA bacteremia cases by almost 50% over a 12-month period.
  - Pre-intervention: MRSA bacteremia incidence rate: 1.27 infections per 1,000 patient days
  - Post-intervention: MRSA bacteremia incidence rate: 0.63 infections per 1,000 patient days
- This study supports decolonization protocols as an effective intervention in reducing MRSA bacteremia rates.

DAILY INPATIENT	PERIOPERATIVE		PRODUCT REPLACED	EXISTING CHG USE
	PRE	POST		
✓				

## Effects of Decolonization Protocols in Pediatric Critical Care Populations.

Schroeder, J., Schieffelin, J., Marney, E. American Journal of Infection Control, Volume 51, Issue 7, S14  
[DOI:https://doi.org/10.1016/j.ajic.2023.04.153](https://doi.org/10.1016/j.ajic.2023.04.153)

- This study aimed to implement a decolonization protocol previously utilized for adult populations in the pediatric critical care (CC) setting (CICU, NICU, and PICU) of an academic pediatric medical center and analyze its impact on patient outcomes.
- Nasal decolonization protocols were developed for children ages two and older (alcohol-based nasal antiseptic) and children younger than 2 (mupirocin). The protocol also included daily CHG bathing for all patients.
- MRSA bacteremia and MRSA rates were analyzed before and after the intervention, using NSHN criteria for identification.
  - Compared to the pre-intervention period, the hospital-onset MRSA rate/1000 patient days dropped 41%, from 1.459 to 0.867.
  - The hospital-onset MRSA bacteremia rate/1000 patient days decreased 54%, from 0.381 to 0.173.
  - MRSA reduction was even more significant in individual units. The cardiac ICU saw an 86% reduction in hospital-onset MRSA cases post-intervention and no MRSA bacteremia cases.
- Decolonization protocols led to a 41% reduction in hospital-onset MRSA rates and a 54% reduction in hospital-onset MRSA bacteremia rates in pediatric CC populations.
- Implementing decolonization protocols in pediatric CC units improves patient outcomes, including a significant reduction in length of stay (from 6.8 days to 6.2 days).
- The decolonization protocol proved cost-effective, with potential savings compared to the cost of treating MRSA infections.

DAILY INPATIENT	PERIOPERATIVE		PRODUCT REPLACED	EXISTING CHG USE
	PRE	POST		
✓				

## About Nozin

Nozin is the leading brand in nasal decolonization. Nozin NOVA programs are a clinically proven infection prevention solution that significantly reduces MRSA and MSSA infections. Designed to improve care, lower infection risk and reduce healthcare costs, NOVA programs utilize Nozin® Nasal Sanitizer® antiseptic with clinically supported infection prevention solutions for hundreds of healthcare facilities nationwide. Learn more at [nozin.com](http://nozin.com).

